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FARMER COOPERATIVE SERVICE  
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The Farmer Cooperative Service conducts research studies and service activities of assistance to farmers in connection with cooperatives engaged in marketing farm products, purchasing farm supplies, and supplying business services. The work of the Service relates to problems of management, organization, policies, financing, merchandising, product quality, costs, efficiency, and membership.

The Service publishes the results of such studies; confers and advises with officials of farmer cooperatives; and works with educational agencies, cooperatives, and others in the dissemination of information relating to cooperative principles and practices.

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# Highlights and Suggestions

Eight selected local retail cooperatives provided information in 1956 for this study of inventory management of farm supply cooperatives. They were in Pennsylvania, Indiana, Ohio, and Michigan; were representative of other retail cooperatives in general operations; were countywide, diversified, and above average in their management of inventories. The study includes operations of the cooperatives' 5 most recent fiscal years. Important facts brought out in the study follow.

Supply volume for the eight associations averaged \$989,000 and ranged from \$157,000 to more than \$1.6 million for the latest fiscal year.

Feed, petroleum, and fertilizer made up about 75 percent of total volume. These three ranked as follows: Feed, slightly more than 30 percent; petroleum, 30 percent; and fertilizer, 14 percent.

## Inventory Size

Inventory size was affected by (1) distribution methods, (2) season, (3) commodities handled, (4) storage space, (5) distance from source of supply, and (6) capital requirements. Storage space was most important in determining size of fertilizer, feed, and petroleum inventories.

Building supplies and farm machinery groups made up 47 percent of total inventories; yet they accounted for only about 18 percent of total sales.

Quarterly inventories for the eight associations averaged \$98,605 with a range from \$12,464 for the quarter ending in November to over \$190,000 for the quarter ending in February. February inventories were 135 percent of the 4-quarter average while November inventories were only 75 percent of this average.

Fertilizer and seed inventories varied more than inventories of other items.

Inventories of these items ranged, respectively, from 67 to 183 and 30 to 216 percent of the 4-quarter average.

## Inventory Turnover

The inventory turnover ratio in this report was calculated by dividing the average of quarterly inventories into total sales. On this basis, petroleum and fertilizer inventories each turned 23 times and feed, 20 times. Turnover on seed was 8 times. Lowest turnovers were on building supplies and farm machinery with 4 and 3 times respectively. Turnover of these six commodity groups averaged 14 times, and total farm supplies turned 11.4 times during the year.

Wide variations existed in turnovers of feed, seed, petroleum, and fertilizer among the eight local associations.

## Acquiring Inventories

Managers and department heads shared responsibility for purchasing supply items in five associations. There were exceptions, however, such as with feed, petroleum, and carload lots of feed ingredients where the responsibility varied. In two associations, branch orders were consolidated on a county basis.

The locals considered advice from wholesale organizations the most important factor in deciding on new lines to carry. Membership surveys and advice from managers, department heads, and boards of directors were also important. Some managers reported college recommendations helped determine the types of feed, seed, and fertilizer carried.

Physical inspection was the most common determinant of time to purchase supplies.

Procurement activities of the last 5 years, which had kept needed inventories to a minimum and improved turnover for

individual associations, included carload purchases, customer advance orders, purchasing with other cooperatives, consignment purchasing, and use of association-owned transport facilities.

### **Maintenance of Stock**

Four associations took physical inventories monthly; one, 10 times a year; two, quarterly; and one, annually. All associations made exceptions to the time pattern for individual commodities.

Shrinkage and overages were attributed mainly to improper recording of stock transactions and loose practices in filling customer orders.

### **Moving Inventories**

Some selling techniques thought helpful in improving inventory turnover included car-door deliveries to patrons, preseason delivery on sales of fertilizer and seed, and increased sales efforts such as advertising and bonus plans for employees. Two associations reported that monthly meetings, sales contests, and picnics for employees helped improve inventory turnover. Another believed that personal contacts of fieldmen with farmers helped show improvement by fostering goodwill and by advertising products.

Detection of slow-moving items was made by visual inspection and general acquaintance with stock. Programs to move slow items included special sales, bargain days, and a yearly open house.

### **Assistance by Regional Cooperatives**

Regional representatives assisted locals with inventory control by (1) calling attention to stock status, (2) encouraging use of better inventory practices, (3) suggesting new lines to carry, (4) providing advertising displays, and (5) recommending selling techniques.

### **Suggestions for Inventory Control**

Although facilities and operating conditions vary by association and area, some inventory control practices have

demonstrated merit. Among those that supply cooperatives might advantageously consider for improving their stock control and turnover are the following:

1. Use job description to indicate responsibility - Good inventory control requires responsibility among personnel for ordering, receiving, storing, and inventorying stocks of merchandise. Outline procedures for every function and be sure each employee knows what is expected of him. An accurate, detailed job description to cover every function is essential for efficient inventory control. Alertness on the part of all who handle merchandise to report irregularities in location, damage to stock, or changes in stock status is important.

2. Reduce handling of stock - Economy and efficiency require methods that minimize handling operations. Possibilities in this field include greater use of direct orders from customers and car-door delivery programs.

3. Use facilities systematically - Arrange warehouse and display layout for fast-moving items so that they will be readily available to customers and convenient for personnel to determine stock status. Minimize the number of locations where individual items may be stocked. Much display, service, and warehouse space can be used interchangeably and thus be kept occupied. With self-service, make it convenient for the customer to pay near the exit. Mechanical lifts and pallets are great labor savers and well worth the capital cost if facilities and operations are large enough to warrant their use. Hazards of theft with open storage of stock should be recognized. Weather deterioration may also occur because of open storage.

4. Order conservatively on a scheduled basis. - In ordering, develop a schedule based on the lapse of time between placing an order and its delivery, and consider order size in terms of the order time period. Stay close to current supply needs and refrain from inventory speculation. This will reduce inventory capital needs and provide space for other stock or activities. Consider carefully any order of general supplies and equipment which means stock on hand for as much as 6 months. The cost of capital

and the chance for obsolescence are real problems.

5. Improve turnover. - Various suggestions for improving turnover have been listed. A rapid inventory turnover has these advantages:

a. It provides opportunities for reducing expenses such as interest on operating capital, insurance, and taxes.

b. It reduces the possibilities of markdowns and shrinkages.

c. It helps to keep merchandise on hand fresh and up-to-date.

Too rapid a turnover, however, may have the following disadvantages:

a. It may cause an increase in expenses such as transportation, clerical, and handling charges.

b. It may increase the number of lost sales by being out of stock while waiting for an order to arrive.

Give careful consideration to the wisdom of holding left-over, seasonal merchandise until the next season. With costs of carrying inventory estimated at more than 10 percent (6 percent interest plus insurance, taxes, and obsolescence) a reduced price at or before the season's close may be wise in disposing of surplus stocks.



# Inventory Management by Selected Retail Farm Supply Co-ops

(Area 1 - Michigan, Indiana, Ohio, Pennsylvania)

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**A**n important aspect of successful retail business is inventory management. Good inventory management begins with purchase of the right things at the right time in the right way. Efficient receiving, and proper recording, displaying and storing must follow, and effective distribution methods are essential.

The goal for farm supply cooperatives is the integration of all these functions so that commodities flow through distribution facilities without loss or damage at rates rapid enough to prevent obsolescence, shrinkage, and the use of excessive inventory capital. This will enable cooperatives to charge reasonable prices for commodities and services and to have adequate margins. Improved agricultural technology, which requires a wider variety of high value supply items for farm production, challenges the ingenuity of management in achieving this goal.

The supply operations and services of cooperatives have changed from an earlier system of taking orders to the present-day extensive system of local feed, seed, and fertilizer warehouses and stores and petroleum bulk plants, delivery trucks, and service stations. In addition to these major supplies required in farming, farmer cooperatives now are

handling other lines such as building materials, automotive equipment, insecticides, and farm and home improvement items. The number of commodity groups and variety of items within each group continue to increase each year.

Farmers have greatly increased their cooperative purchasing of farm supplies in the last 30 years. From about 1,200 local supply associations with a volume of \$135 million in 1925-26, the number increased to 3,344 predominantly farm supply cooperatives with a net volume of \$1.5 billion in 1954-55. The real growth in volume was not as great as the figures indicate, however, because of the rise in price level. The index of prices paid for farm supply commodities, with 1947-49 as 100, rose from 61 in 1925 to 106 in 1954. This means that the \$1.5 billion in 1954-55 was equal to \$862.1 million on the basis of 1925 prices, or a volume increase of 6.4 times.

In addition to purchases from supply cooperatives, farmers also purchased another \$500 million of supplies through their predominantly marketing associations in 1954-55. Approximately 23 percent of farm purchases of feed, seed, fertilizer, and petroleum were made on a cooperative basis in 1954.

Procuring, storing or warehousing, and distributing these farm supply items comprise the broad field of inventory management. These functions require considerable outlays of capital for supplies and facilities, and for personnel to serve patrons and handle stock. For example, if the farm supply inventories of the cooperatives which distributed about \$2 billion of supplies were turned

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Note: The author expresses appreciation to officials of the farmer cooperatives who provided information on their inventory operations, and to J. Warren Mather, Chief, Farm Supplies Branch, Farmer Cooperative Service, U. S. Dept. of Agric., for assistance in planning and developing this study.

as many as 10 times a year, management would be responsible for an average of \$200 million worth of retail inventories. About 20 percent of the year-end capital in farm supply cooperatives is in

inventory. The effective utilization of capital and personnel requires the application of recognized successful practices to all phases of inventory management.

## Purpose and Method of Study

This study is the initial one of a series Farmer Cooperative Service is making of inventory management by general farm supply cooperatives in various geographic areas of the United States. It endeavors to:

1. Determine purchasing policies and practices that affect inventory acquisition;

2. Ascertain successful practices for storing and controlling inventories and shrinkage in merchandise;

3. Determine principal sales methods affecting inventory turnover, especially those for slow-moving merchandise; and

4. Recommend successful standards and methods for inventory management.

This study included eight local associations in Indiana, Michigan, Ohio, and Pennsylvania. To distinguish this report from others in the series, these States are designed as Area 1. These county-wide associations were affiliated with State wholesale cooperatives and carried similar diversified lines of production supplies. Several had one or more branch warehouses.

These associations were selected on the basis that management of inventory

operations was better than average. Criteria for judging operations included (1) inventory turnover ratio, (2) overage and shortage data, and (3) evaluation of inventory acquisition and control practices in the local cooperatives by district fieldmen and department heads of the regional associations.

General managers of the selected associations provided information through personal interviews.

Figure 1 indicates that the eight selected associations were above average in inventory performance. Based on total sales, they turned their inventory of all farm supplies 11.4 times in 1955-56 compared to an average of 7 times for 84 other local associations in one State in 1955. The average turnover of three commodity groups -- feed, petroleum, and fertilizer -- which accounted for more than 70 percent of total sales, was 22 times for the eight associations compared to 16 times for the 84 associations.

A review of the inventory practices of these cooperatives selected for study should be helpful to other associations with similar overall operations.

## Volume and Type of Supplies Distributed

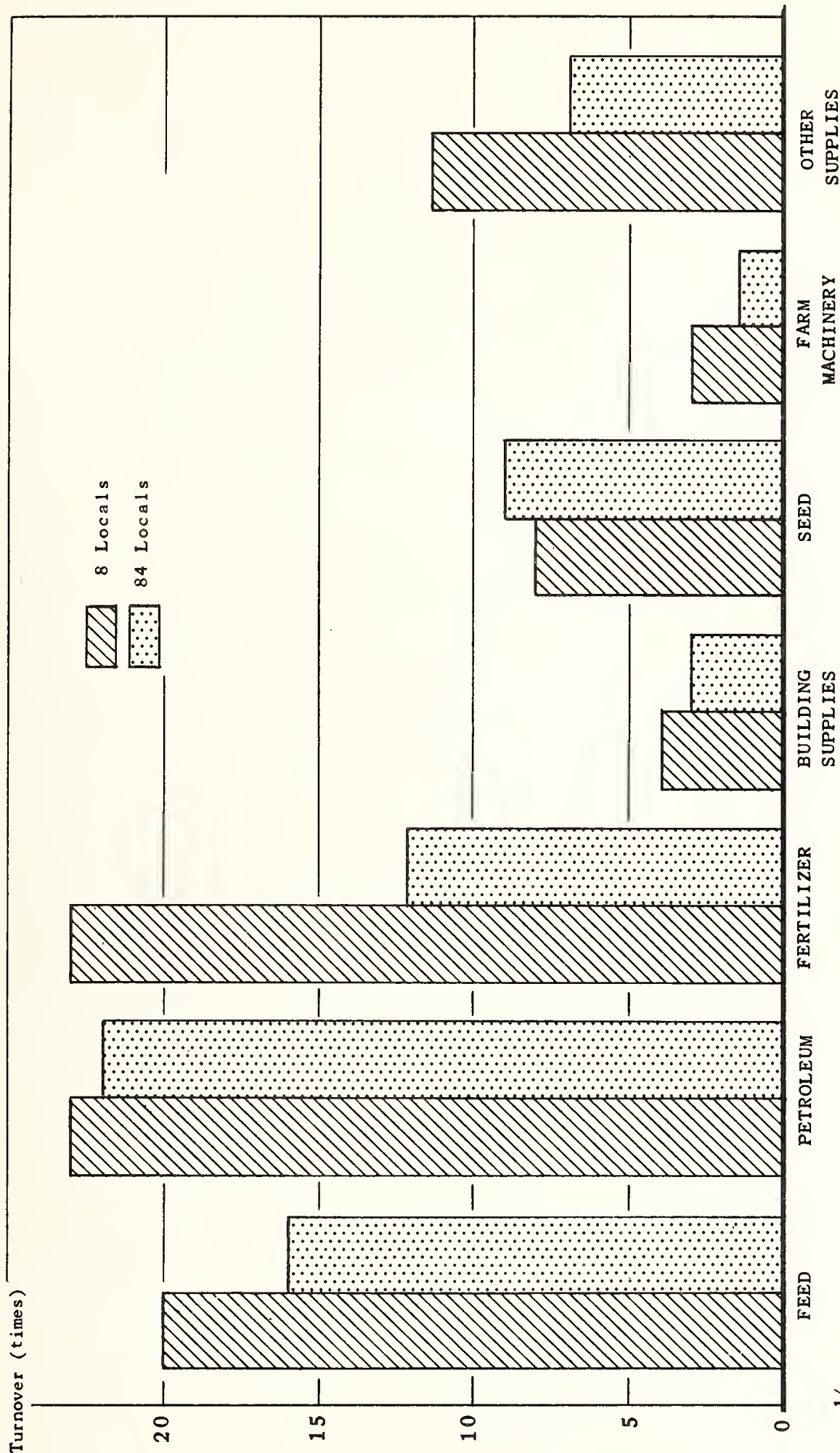
The average supply volume of the eight locals was \$989,166 in 1955-56 with a range from about \$157,000 to more than \$1.6 million (table 1).

Three major commodity groups in order of their importance -- feed, petroleum, and fertilizer -- made up 75 percent of total sales volume. Seed

represented about 7 percent; building supply items made up 10 percent of volume in six associations; and on an average of five associations farm machinery represented 8 percent of sales. The proportion of total volume represented by these six main commodity groups averaged 92 percent and ranged from 88 to 94 percent.



FIGURE 1  
INVENTORY TURNOVER FOR SELECTED COMMODITIES, 1955-56<sup>1/</sup>  
EIGHT LOCAL FARM SUPPLY COOPERATIVES IN FOUR STATES AND 84 LOCALS IN ONE STATE



<sup>1/</sup> Based on total sales

Table 1. - Total farm supply sales volume and proportion of total in selected commodity groups, eight local farm supply cooperatives in four States, 1955-56

Associ- ation code	Total farm supply volume	Proportion of total supply volume by commodity groups							
		Feed	Petroleum	Ferti- lizer	Building supplies	Seed	Farm machinery	Other supplies	Total
Percent									
1	\$655,758	35	27	9	5	14	0	10	100
2	156,964	51	14	23	6	9	0	7	100
3	1,256,319	20	30	13	22	2	6	7	100
4	954,637	12	46	16	9	1	10	6	100
5	872,447	20	20	17	14	7	15	7	100
6	938,870	31	25	17	7	8	4	8	100
7	1,453,808	39	30	9	(2)	6	5	11	100
8	1,629,265	36	31	14	(2)	7	0	12	100
Average	989,166	31	30	14	10	7	8	8	3100

<sup>1</sup>Not comparable so not included in average.

<sup>2</sup>Not reported separately.

<sup>3</sup>Averages do not add to total because some associations were omitted in calculating individual commodity averages.

## Size of Inventory

Inventory size is determined by many factors such as (1) procurement and distribution methods, (2) seasonal variations in demand, (3) types of commodities handled, (4) available storage space, (5) distance from source of supply and (6) capital requirements.

Among the cooperatives included in this study, available storage space had special significance in determining inventories of fertilizer, feed, and petroleum. Distance from source of supply was listed by five association representatives as affecting size of inventory of these groups as well as those of seed and machinery. Two associations considered capital requirements limited inventories of building supplies and farm machinery.

In order to obtain representative inventory figures for computing turnovers, an average inventory for the year is necessary. Because monthly inventories were not available at all associations, an average of quarterly inventories was used. Seven associations took inventories for quarters ending in February, May, August, and November. Inventory months of the other were March, June, September, and December. Such

quarterly averages appear adequate for turnover calculations because the monthly inventories in four associations were only about 2 percent smaller than the quarterly inventories in the same associations. These quarterly inventories, however, were about 15 percent larger than the average of the inventories at the beginning and the end of the fiscal year.

Quarterly inventories of the eight associations averaged \$98,605 and ranged from a low of \$12,464 to a high of \$190,834 (table 2). The association with the smallest inventory had the lowest supply volume and did not handle farm machinery. The association with the largest inventory had a relatively large supply volume and stocked both farm machinery and lumber.

The demand pattern of some farm supplies, for instance building and machinery items, is often unpredictable, both day-to-day and seasonally. Yet to provide such supplies when needed by patrons, a diversity of items must be carried even though the time of actual sale may be 6 or 9 months hence. This is especially true of repair parts for farm machinery because these items may



remain in stock for months or occasionally years without moving. In contrast, feed and petroleum products are production operating items with quite a predictable demand pattern.

Not only is the patron demand pattern different, but the supply pattern for the association is vastly different. The supply "pipe line" is generally full of feed and petroleum items and orders can be filled immediately. For building supplies and machinery, however, considerable time may elapse before an order can be delivered to the association. Therefore, the association, to satisfactorily meet patrons' demands, must recognize the demand and supply characteristics of each commodity and consider order-size and stock-on-hand accordingly. The effect of these factors is to make some commodity inventories appear large in comparison with their respective sales volume. Figure 2 shows the proportion of total sales and average quarterly inventories represented by selected commodity groups.

Although, as previously stated, three commodity groups -- feed, petroleum and fertilizer--accounted for 75 percent of total sales, they represented less than 40 percent of average inventories. In contrast, building supplies and farm machinery accounted for only 18 percent of total

supply volume, but 47 percent of average inventories.

The commodity groups also varied considerably in inventory size by quarters, as shown in table 3. In the last fiscal year, the first quarter inventory for all six commodity groups was 135 percent of average compared to only 75 percent of average for the fourth quarter inventory. Stated in terms of inventory capital requirements for the six commodity groups, 35 percent more than average had been used at the end of the first quarter in February but 25 percent less than average had been used at the end of the fourth quarter in November. For associations with operating patterns similar to those in this study, such information should be beneficial in capital planning on a quarterly basis.

The greatest quarterly fluctuation in inventory size among the commodities was in seed. From an inventory at the end of the first quarter in February of 216 percent of average, it dropped to an inventory low of only 30 percent of average at the end of the third quarter in August. Fertilizer inventory fluctuated from a high of 183 in February to a low of 67 percent in both August and November. For the other four commodity groups, inventory was more stable over the seasons, varying 24 to 31 percent from average.

Table 2. - Average farm supply inventories and proportion of total represented by selected commodity groups in eight local farm supply cooperatives in four States, 1955-56

Associ- ation code	Average farm supply inventory	Proportion of supply inventory by commodity groups							
		Feed	Petroleum	Ferti- lizer	Seed	Building supplies	Farm machinery	Other supplies	Total
Percent									
1	\$42,403	19	29	6	8	21	0	17	100
2	12,464	35	7	17	10	15	0	16	100
3	190,834	9	10	4	3	38	23	13	100
4	119,658	4	17	8	2	29	37	3	100
5	129,890	10	4	5	7	16	34	24	100
6	108,453	14	10	1	10	16	12	37	100
7	98,492	23	7	6	11	(1)	21	32	100
8	86,646	30	9	9	13	(1)	0	39	100
Average	98,605	18	12	7	8	22	25	25	<sup>2</sup> 100

<sup>1</sup>No separate inventory available.

<sup>2</sup>Averages do not add to total because some associations were omitted in calculating individual commodity averages.

FIGURE 2  
 PROPORTION OF TOTAL SALES AND OF AVERAGE QUARTERLY INVENTORIES REPRESENTED  
 BY SELECTED COMMODITY GROUPS, 1955-56  
 EIGHT LOCAL FARM SUPPLY COOPERATIVES IN FOUR STATES



Table 3. - Quarterly fluctuations in dollar volume of selected commodity inventories,<sup>1</sup> eight local farm supply cooperatives, 1955-56<sup>2</sup>

Commodity	Quarters				Maximum fluctuation
	First	Second	Third	Fourth	
Percent					
Feed	107	92	112	88	24
Petroleum	94	102	119	88	31
Fertilizer	183	67	89	67	116
Building supplies	99	113	102	86	27
Seed	216	96	30	37	187
Farm machinery	109	105	104	82	27
Average	135	96	93	75	60

<sup>1</sup>Inventories for quarters ending in February, May, August, November, except one association which was a month later each quarter.

<sup>2</sup>Average of quarterly inventories = 100.

## Inventory Turnover

Inventory turnover is a ratio expressing the number of times a year an average inventory is sold. It is a measure of the use of inventory capital, and high turnover is associated with good management practices and should result in higher net margins. It is generally computed by dividing cost of goods sold for the year by the average inventory on hand during the year.

The more frequently inventories are taken, the more typical the average inventory figure will be. Because inventories generally are carried at or near cost, it is more accurate to use cost of goods sold than sales. If sales are divided by average inventories, the turnover ratio will be over-stated to the extent of the percentage markup. But because data were not available on the cost of all commodities handled by the eight associations included in this study, inventory turnover in this report has been based on sales rather than cost of goods sold.

While a high inventory turnover is generally considered a criterion of effective inventory management, an extremely high turnover may indicate inadequate or even poor service. An association which has no display or is always out of stock cannot adequately

serve its patrons. When a patron obtains short or nonstocked items elsewhere, he may at the same time purchase other items, which could have been obtained from his own cooperative, thus further reducing its volume.

Turnover within commodity groups varied considerably among the eight cooperatives studied (table 4). Because of this, a median turnover was used rather than an arithmetic mean. Or in other words, the mid-point of the turnovers for the eight associations was used rather than the average of their total sales divided by their total inventories. In feed the median turnover was 20 times and ranged from a low of 13 to a high of 29 times. Petroleum and fertilizer inventories each turned 23 times. Turnover of petroleum ranged from 6 to 62 times and fertilizer from 15 to 129 times. Such wide ranges were due, in part, to contrasting selling practices such as withdrawal from warehouse stock as against car-door delivery for customer orders. Turnover on seed averaged 8 times, ranging among associations from 5 to 26 times a year.

Both building supplies and farm machinery had high inventories in relation to sales volume. Median turnover on building supply items was 4 times with



Table 4. - Inventory turnover for selected commodity groups in eight local farm supply cooperatives in four States, 1955-56<sup>1</sup>

Coopera- tive code	Commodity groups								
	Feed	Petroleum	Fertilizer	Building supplies	Seed	Farm machinery	Six major groups	Other supplies	Total farm supplies
<i>Inventory turnover - times per year</i>									
1	29	15	23	4	26	(2)	17	9	15.5
2	19	6	17	5	11	(2)	14	6	12.6
3	15	20	20	4	5	2	7	4	6.6
4	22	22	15	2	5	2	8	20	8.0
5	13	32	23	6	7	3	8	2	6.7
6	19	23	129	3	7	3	13	2	8.7
7	25	57	24	(2)	8	4	19	5	14.8
8	22	62	30	(2)	10	(2)	26	6	18.2
Median	20	23	23	4	8	3	<sup>3</sup> 14	6	<sup>3</sup> 11.4
Range	13-29	6-62	15-129	2-6	5-26	2-4	7-26	2-20	6.6-18.2

<sup>1</sup>Based on total sales and average quarterly inventories.

<sup>2</sup>Not handled.

<sup>3</sup>Arithmetic average.

a narrow range of from 2 to 6 times. The farm machinery inventory turned 3 times, and ranged from 2 to 4 times among individual associations. The association with the highest turnover for machinery had a singular advantage in that considerable machinery in its stock was on a consignment basis, thus reducing its capital requirements for machinery inventory.

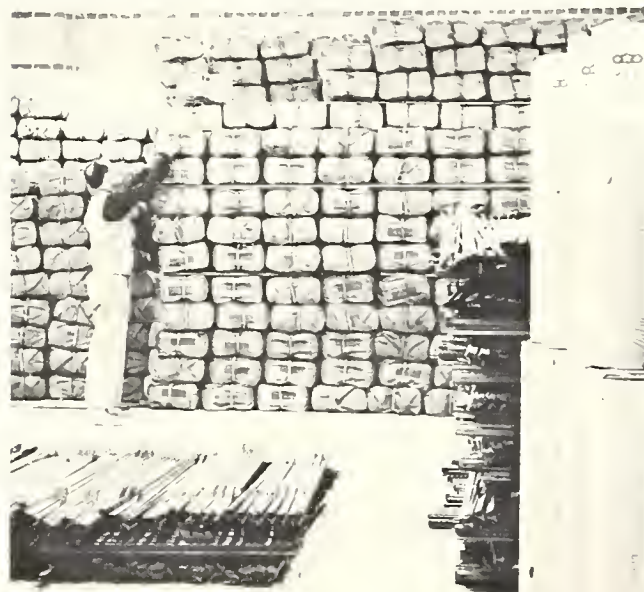
The median turnover for the six major commodity groups was 14 times and for

total farm supplies 11.4 times a year. Except for one association, the turnover on miscellaneous items was lower than that of the six major commodity groups.

Turnover comparisons for total inventories of all supplies often are quite meaningless because the proportions of sales and inventories represented by different commodity groups vary so greatly among associations. However, it is a useful measure for an individual association to use over a period to check its own operations.

It is also useful in comparing commodity groups among associations with similar operations. An association with inventory turnovers on specific commodity groups below that of other associations with comparable volumes and kinds of supplies handled could well appraise its own purchasing, storing, and selling methods against the practices of the better associations.

Two associations obtained improved inventory turnover by developing better employee relations programs. Activities for employees included monthly meetings, sales contests, and picnics. Other factors affecting turnover are discussed in the remaining sections of this report dealing with acquisition, maintenance, and movement of inventories and assistance provided by regional associations on these problems.



A co-op that arranges stock to make individual items easy to locate and count simplifies inventory taking.



# Acquisition of Inventories

The problems of inventory begin with procurement. The decisions of what, when, and how much to buy, choice of sources of supply, and receiving procedures are important activities affecting inventory. A description follows of important procurement practices of the eight cooperatives studied.

## Responsibility for Purchasing

In five cooperatives, managers and department heads jointly shared responsibility for purchasing most supplies. However, this sharing did not cover all items. In two of the five, managers purchased all carload lots of feed ingredients. In one, department heads bought the feed and petroleum. In another, branch managers were responsible for initiating purchase orders, which were then checked by the general manager. In two countywide cooperatives, purchases of branches were consolidated on a county basis, where possible, to get quantity discounts.

In deciding on new lines of supplies to carry, the following aids were listed in order of importance: (1) Advice from the wholesale organizations -- listed as first by six associations; (2) surveys of members' desires; and (3) managers' decisions. Other significant considerations included advice from department heads; college recommendations on feed, seed, and pesticides; and suggestions from boards of directors.

One manager, while recognizing the importance of the above factors, listed the following as most basic in determining what new items to stock: Adequate margin, sufficient volume, and available capital. The use of a "want" book proved helpful in another association.

Visual inspection of stock was considered the most common determinant of when to purchase regular items. Employees working with supply items were expected to be informed of stock status. Perpetual inventory cards were used extensively for machinery parts, but they

were used very little, if at all, for other items.

## Procurement Methods

Many procurement techniques contribute to an efficient distribution of stock without the association bearing an excessive inventory burden. For some items it is possible to make distribution without the stock ever being physically handled by the distributor.

Association representatives were asked about procurement methods during the last 5 years which had tended to keep needed inventories to a minimum or reduce the average quantity or cost of their inventories in relation to sales volume. These may be considered as procurement methods which helped to maintain or improve turnovers.

Methods listed as most important and the number using each were: (1) Purchasing by the carload by seven associations, and (2) purchasing on the basis of customer orders by five associations. Items most frequently purchased in carload lots were oyster shell, lumber, twine, and feed ingredients. Customer orders were used in obtaining appliances, automotive and hardware items, seed potatoes, and some fertilizer.

Other methods of procurement considered as aids in minimizing needed inventory were: (1) purchasing with other cooperatives, (2) consignment, especially in machinery, and (3) use of association-owned transport facilities to deliver supplies from the regional wholesale or manufacturing cooperative to local associations or branches, or direct to patrons. One manager stressed the importance of "buying rather than being sold." Another said that obtaining a closer source of supply helped his situation.

The value of discounts offered to locals for quantity purchases was subject to so many qualifications that most managers saw no general advantage in them. Some of the qualifications were the time of purchase, amount of discount, storage facilities, and availability of capital.

## Maintenance of Stock

Important aspects of inventory management are accuracy of counting, recording, and physical care of stock. Counting and recording provide a cooperative with a check on the correctness with which new stock is added and outgoing stock deducted. Some associations operate on such precise markups that operating statement margins reveal abnormal losses or overages in inventories. Variation from the expected margins indicates possible errors in shipping, receiving, recording, inventorying, distributing, or other stock-control activities.

Management must always be on guard against unnecessary deterioration, shrinkage, and obsolescence. Arrangement of warehouse space affects efficiency of handling, inventorying, and displaying goods. Information obtained on several of these points follows.

### Inventorying

The time and regularity of inventory-taking varied considerably among cooperatives and also by commodities. These variations were as follows:

(1) Five associations took monthly inventories of most commodities. One considered such inventories important for insurance purposes. One of the five associations took a monthly inventory of all stock except lumber, which was taken yearly. Another took 10 inventories a year except for farm machinery and building supplies, which were counted twice a year. One association omitted inactive items from monthly inventories. Examples of such were paint and insecticides in the winter months.

(2) Two associations took quarterly inventories with records adjusted to the year-end inventory.

(3) Another association took inventories twice a year on all items except petroleum, feed, and seed, which were inventoried monthly.

Three associations stated that inventorying was a two-man operation -- counting and recording. One association closed its doors to patrons during the fiscal year-end inventory; boards of

directors of two assisted with inventorying.

One association carried inventories at cost; two, at market; and five, at the lower of cost or market.

### Shrinkage

Shrinkage often occurs because of failure to record all stock movements and because of damage and theft. Seldom are distribution operations free from these conditions. The significance of shrinkage varies by commodities. In petroleum, variations in inventory also may result from volatilization and changes in temperature as well as from recording, damage, and theft. Overages may even occur for some fuels. Representatives of some associations included in this study recognized that open storage was inviting losses.

Data on shrinkage among the eight cooperatives were limited. For six, shrinkage on gasoline and fuel oil was about 1 percent. However, one of the six had shrinkages of 0.6 and 0.1 percent respectively for gasoline and fuel oil.

Practices in filling customer orders were blamed for many shortages. Several cooperative representatives reported that such losses could be minimized by requiring sales or delivery slips for all items drawn from stock. This was accomplished in various manners. Three associations required customers to get sales slips from the sales office before orders were filled in the warehouses. No items could be taken from stock for customer orders except those shown on the order form. Also, employees were instructed to initial or mark tickets as orders were filled. This was done to prevent customers from having their orders filled two or more times on tickets which were completed in the office prior to the time items were drawn from stock.

Another association thought self-service contributed to inventory losses. One association had prepared serially numbered sales tickets for each warehouse for use of patrons in making



selections. Tickets were checked daily to assure that all had been processed and properly recorded. This made it less likely for merchandise that had been written up on warehouse tickets to be removed by customers without clearing the sales office.

### Insurance

Even with the best practices, management is unable to eliminate many hazards associated with keeping and handling inventories. Insurance programs minimize such hazards. The principal

inventory risks of an insurable nature are fire and theft. Insurance practices reported in this study included:

1. Fire insurance of a maximum amount on gasoline, fuel, oil, and other combustible petroleum products.

2. Fire coverage on other items adjusted on the basis of monthly inventory reports.

3. Burglary insurance of a group type providing \$1,500 coverage for each individual loss.

While State wholesale cooperatives provided some blanket coverages, individual locals generally selected insurance carriers.

## Moving Inventories

The problem in moving inventories ends when the cooperative distributes its goods, and they are either converted into cash or receivables. The effectiveness of sales or merchandising programs greatly influences the rate at which inventories are turned each year.

Sometimes it is difficult to determine if a certain technique is one of procurement or distribution. Taking orders for car-door delivery involves aspects of both procurement and distribution. Whether distribution techniques are planned at time of procurement or after the stock is on hand, they have considerable effect on inventory volume.

### Distribution Methods

Distribution techniques considered to be effective in minimizing the average volume of needed inventory included:

1. Increased sales efforts through newspaper and radio advertising, price-reduction programs, and employee sales-bonus plans. Four associations stressed the value of these activities. However, two other associations had reduced their advertising expenditures because of unsatisfactory results in the past.

2. Car-door deliveries where patrons took items off the car and eliminated any handling by the cooperative. These were considered effective by four asso-

ciations. Fertilizer and feed were the principal groups handled in this manner.

3. Pre-season delivery on sales of fertilizer and seed. This was a common practice among the eight associations.

4. Encouragement of patrons to make fewer but larger purchases of feed and petroleum. One association found this a successful means of holding inventories down, and another had fair success in getting patrons to order a 6-month supply of oils and greases.

- (5) Transfer by one association of funds from its advertising budget to a field selling program. In this contact men visited farmers, took orders, and pushed the cooperative's program in general.

- (6) Use, by one association, of trading stamps to increase or hold volume.

### Slow-Moving Items

With all stocks of merchandise, there is the possibility that some items will not move. This may happen because of failure to anticipate demand correctly, wrong choice of items, or untimeliness as to season. In such cases, items may become out-dated. Still others deteriorate physically with age.

Detection of stock items that moved slowly or not at all depended on observation and general acquaintance with stock in all cooperatives included in this study.

However, stock cards on machine parts at two associations showed item activity.

Six associations made special efforts to clear slow-moving items. Efforts

included special sales, yearly open houses, and bargain days. One regional wholesale promoted transfers of slow-moving items between locals.

## Assistance by Regional Cooperatives

Representatives of regional associations have many opportunities to assist local associations with inventory control. The ways they helped and the extent of the recognition locals gave to their

Type of assistance	Associations reporting assistance
	Number
1. Calling attention to status and condition of stock	5
2. Encouraging use of better inventory practices	5
3. Suggesting new lines to carry	5
4. Helping with advertising displays	7
5. Providing training on selling techniques	8

assistance is indicated in the accompanying tabulation.

Other types of regional programs locals considered worthwhile in inventory control included transfers of stock between associations and area advertising by newspaper and radio.

Four associations thought regional representatives sometimes encouraged the locals to carry larger inventories than necessary. No attempt was made, however, to determine the extent or validity of these opinions nor of those pertaining to assistance from the regionals.

## Individual Cooperative Summaries

Some background information on type and scope of operations, proportion of volume and inventory by principal commodity groups, and significant inventory practices of individual associations may be useful in appraising practices. A brief writeup of each association follows.

### Cooperative 1

This association had a farm supply volume of almost \$656,000 in 1956. Of its total volume, 35 percent was in feed, 27 percent in petroleum, 14 percent in seed, 9 percent in fertilizer, 5 percent in

Table 5. - Farm supply sales and inventory data for Cooperative 1, fiscal year 1956

Commodity	Farm supply sales		Quarterly average inventory		
	Amount	Proportion of total	Amount	Proportion of total inventory	Inventory turnover <sup>1</sup>
		Percent		Percent	Times
Feed	\$228,878	35	\$7,943	19	29
Petroleum	179,232	27	12,193	29	15
Fertilizer	59,658	9	2,640	6	23
Building supplies	32,753	5	8,794	21	4
Seed	90,762	14	3,472	8	26
Subtotal	591,283	90	35,042	83	17
Other	64,475	10	7,361	17	9
Total or average	655,758	100	42,403	100	15

<sup>1</sup>Based on sales and quarterly inventories.



building supplies, and the remaining 10 percent in general supplies (table 5).

Turnover of inventory, based on total supply sales and the average of quarterly inventories, was 15 times in 1956. Supply volume had increased considerably during the previous 5 years.

Inventory performance for the 1956 fiscal year compared with that of 5 years earlier was as follows:

Item	1956	1952
Cost of farm supplies sold	\$557,461	\$403,239
Year-end inventory	\$44,998	\$38,653
Inventory turnover (times) <sup>1</sup>	12	10
Proportion of assets in inventory (percent)	11	18

<sup>1</sup>Based on cost of goods sold.

Responsibility for purchasing supplies rested with the manager although department heads worked closely with him. An association-owned semitrailer, which transported feed from the source of supply to the association or directly to the patron, was an important factor in achieving a turnover of 29 times for feed in 1956.

## Cooperative 2

Supply volume of this association was \$157,000 in 1956 of which feed accounted

for just over one-half. Fertilizer was next, accounting for 23 percent of total volume. Including petroleum, building supplies and seed, 93 percent of total volume originated in five commodity groups. Of the quarterly inventories, 84 percent were in the same supply groups (table 6).

Dollar volume of this cooperative declined during the 5-year period, mostly because of a drop in feed prices. Turnover in 1956 was about 13 times.

Inventory performance for the 1956 fiscal year compared with that of 5 years earlier was as follows:

Item	1956	1952
Cost of farm supplies sold	\$132,434	\$196,528
Year-end inventory	\$11,399	\$14,501
Inventory turnover (times) <sup>1</sup>	12	14
Proportion of assets in inventory (percent)	Not available	Not available

<sup>1</sup>Based on cost of goods sold.

The manager purchased all items with the advice of department heads. On feed and steel, car-load orders were pooled with other cooperatives. Each local delivered its own order from the railroad at the point of lowest freight cost.

Table 6. - Farm supply sales and inventory data for Cooperative 2, fiscal year 1956

Commodity	Farm supply sales		Quarterly average inventory		
	Amount	Proportion of total	Amount	Proportion of total inventory	Inventory turnover <sup>1</sup>
		Percent		Percent	Times
Feed	\$80,106	51	\$4,304	35	19
Petroleum	5,422	4	908	7	6
Fertilizer	36,658	23	2,129	17	17
Building supplies	8,686	6	1,845	15	5
Seed	14,430	9	1,265	10	11
Subtotal	145,302	93	10,451	84	14
Other	11,662	7	2,013	16	6
Total or average	156,964	100	12,464	100	13

<sup>1</sup>Based on sales and quarterly inventories.

Table 7. - Farm supply sales and inventory data for Cooperative 3, fiscal year 1955

Commodity	Farm supply sales		Quarterly average inventory		
	Amount	Proportion of total	Amount	Proportion of total inventory	Inventory turnover <sup>1</sup>
		Percent		Percent	Times
Feed	\$253,364	20	\$16,442	9	15
Petroleum	372,261	30	18,993	10	20
Fertilizer	166,308	13	8,182	4	20
Building supplies <sup>2</sup>	270,177	22	73,210	38	4
Seed	24,022	2	5,002	3	5
Farm machinery	80,551	6	44,406	23	2
Subtotal	1,167,223	93	166,235	87	7
Other	89,096	7	24,599	13	4
Total or average	1,256,319	100	190,834	100	7

<sup>1</sup>Based on sales and quarterly inventories.<sup>2</sup>Includes lumber.

### Cooperative 3

This association had a farm supply volume in 1955 of almost \$1.3 million. Of this total volume, 93 percent was in the six major commodity groups with 30 percent in petroleum, and 22 and 20 percent, respectively, in building supplies and feed. Lumber was included in the building supply group (table 7).

Inventory performance for the 1955 fiscal year compared with that of 5 years earlier was as follows:

Item	1955	1951
Cost of farm supplies sold	\$1,060,050	\$739,780
Year-end inventory	\$176,233	\$127,332
Inventory turnover (times) <sup>1</sup>	6	6
Proportion of assets in inventory (percent)	21	Not available

<sup>1</sup>Based on cost of goods sold.

Branch managers originated purchase orders, but all orders were cleared through the county manager. The latter also checked invoices, sales, and inventory data of branches to suggest changes in orders or transfer of items between branches. The county manager visited branches twice a week.

The association considered that operation of its own semitrailer offered many economies in procurement.

A program of taking monthly inventories on all items was followed except for lumber, which was inventoried yearly. Operations closed for 1 day while inventory for the fiscal year was taken.

### Cooperative 4

Petroleum accounted for 46 percent of the total supply volume of more than \$954,000 in this association. Fertilizer was next in importance with 16 percent of total volume. Lumber was included in building supply sales and inventory figures. Farm machinery made up 10 percent of sales but 37 percent of inventory (table 8).

Inventory performance for the 1955 fiscal year compared with that of 5 years earlier was as follows:

Item	1955	1951
Cost of farm supplies sold	\$798,448	\$568,442
Year-end inventory	\$117,386	\$93,362
Inventory turnover (times) <sup>1</sup>	7	6
Proportion of assets in inventory (percent)	22	Not available

<sup>1</sup>Based on cost of goods sold.

Table 8. - Farm supply sales and inventory data for Cooperative 4, fiscal year 1955

Commodity	Farm supply sales		Quarterly average inventory		
	Amount	Proportion of total	Amount	Proportion of total inventory	Inventory turnover <sup>1</sup>
		Percent		Percent	Times
Feed	\$111,164	12	\$4,947	4	22
Petroleum	441,879	46	29,057	17	22
Fertilizer	150,826	16	10,008	8	15
Building supplies <sup>2</sup>	82,306	9	35,282	29	2
Seed	14,661	1	2,761	2	5
Farm machinery	98,746	10	43,874	37	2
Subtotal	899,582	94	116,929	98	8
Other	55,055	6	2,729	2	20
Total or average	954,637	100	119,658	100	8

<sup>1</sup>Based on sales and quarterly inventories.<sup>2</sup>Includes lumber.

Department heads purchased feed and petroleum, but the county and branch managers shared with department heads the responsibility for purchasing other commodities.

Inventories were taken twice a year on building supplies, fertilizer, and hardware items. Monthly inventories were taken on feed, seed, and petroleum. Those for liquid petroleum were conducted daily.

### Cooperative 5

With total supply volume of more than \$872,000 in 1955, feed and petroleum in this association each represented about 20 percent. Fertilizer and farm machinery were next in importance with 17 and 15 percent, respectively. Six commodity groups accounted for 93 percent of volume and 76 percent of inventory. Farm machinery made up more than a

Table 9. - Farm supply sales and inventory data for Cooperative 5, fiscal year 1955

Commodity	Farm supply sales		Quarterly average inventory		
	Amount	Proportion of total	Amount	Proportion of total inventory	Inventory turnover <sup>1</sup>
		Percent		Percent	Times
Feed	\$174,388	20	\$13,028	10	13
Petroleum	169,255	20	5,298	4	32
Fertilizer	147,075	17	6,379	5	23
Building supplies	124,510	14	21,005	16	6
Seed	63,515	7	9,560	7	7
Farm machinery	130,886	15	43,319	34	3
Subtotal	809,629	93	98,589	76	8
Other	62,818	7	31,301	24	2
Total or average	872,447	100	129,890	100	7

<sup>1</sup>Based on sales and quarterly inventories.



third of total inventory, but accounted for only 15 percent of total sales (table 9).

Inventory performance for the 1955 fiscal year compared with that of 5 years earlier was as follows:

Item	1955	1951
Cost of farm supplies sold	\$768,186	\$503,846
Year-end inventory	\$113,159	\$78,501
Inventory turnover (times) <sup>1</sup>	7	6
Proportion of assets in inventory (percent)	28	27

<sup>1</sup>Based on cost of goods sold.

Branch managers originated purchase orders which funneled through the county office for consolidation. This procedure made possible more quantity discounts in purchasing. The county manager did all the buying from sources other than affiliated wholesale and manufacturing cooperatives. Inventory items were transferred from branch to branch on the basis of cost.

Ten monthly inventories were taken of all items except farm machinery and building supplies. These were inventoried each 6 months. Records were adjusted to the semiannual inventory figures. Board members assisted in pairs with yearly inventories at branches.

This association used trading stamps as a promotion scheme. It gave stamps equaling an estimated 2.4 percent discount for cash purchases or for charges paid within a month after receipt of statement.

### Cooperative 6

This cooperative had a farm supply volume of approximately \$939,000 in 1955. Of this total, 31 percent was in feed with 25 and 17 percent, respectively, in petroleum and fertilizer. Six major commodity groups represented 92 percent of total supply volume and 63 percent of average inventory (table 10).

Inventory performance for the 1955 fiscal year compared with that of 5 years earlier was as follows:

Item	1955	1951
Cost of farm supplies sold	\$812,881	\$835,858
Year-end inventory	\$71,865	\$98,183
Inventory turnover (times) <sup>1</sup>	11	9
Proportion of assets in inventory (percent)	15	Not available

<sup>1</sup>Based on cost of goods sold.

Each department head was responsible for purchasing regular nonseasonal

Table 10. - Farm supply sales and inventory data for Cooperative 6, fiscal year 1955

Commodity	Farm supply sales		Quarterly average inventory		
	Amount	Proportion of total	Amount	Proportion of total inventory	Inventory turnover <sup>1</sup>
		Percent		Percent	Times
Feed	\$287,053	31	\$15,039	14	19
Petroleum	234,423	25	10,345	10	23
Fertilizer	164,005	17	1,270	1	129
Building supplies	61,303	7	17,688	16	3
Seed	76,977	8	11,305	10	7
Farm machinery	39,274	4	13,088	12	3
Subtotal	863,035	92	68,735	63	13
Other	75,835	8	39,718	37	2
Total or average	938,870	100	108,453	100	9

<sup>1</sup>Based on sales and quarterly inventories.



Table 11. - Farm supply sales and inventory data for Cooperative 7, fiscal year 1956

Commodity	Farm supply sales		Quarterly average inventory		
	Amount	Proportion of total	Amount	Proportion of total inventory	Inventory turnover <sup>1</sup>
		Percent		Percent	Times
Feed	\$566,299	39	\$22,495	23	25
Petroleum	431,495	30	7,513	7	57
Fertilizer	131,536	9	5,581	6	24
Seed	10,128	6	10,691	11	8
Farm machinery	73,016	5	20,299	21	4
Subtotal	1,292,474	89	66,579	68	19
Other	161,334	11	31,940	32	5
Total or average	1,453,808	100	98,492	100	15

<sup>1</sup>Based on sales and quarterly inventories.

supplies. For new items, or seasonal supplies like seed or fertilizer, the county manager did the purchasing.

Patrons of this cooperative took considerable feed and fertilizer from the railroad car. Customer orders were used extensively in hardware, appliances, and automotive supplies as ways of holding down inventory.

Physical inventories were taken each month for all supplies except seasonal items, which were inventoried in months of relative inactivity.

This association stopped handling machinery in 1955 because facilities for handling it were inadequate, and it had failed to pay its way.

An outstanding practice of this association was making available to employees written job descriptions on receiving, storing, and inventorying merchandise.

### Cooperative 7

This association had a farm supply volume of about \$1.5 million in 1956. Feed represented 39 percent and petroleum 30 percent. Building supply items were not listed separately in the sales or inventory summaries so they increased the relative size of the "other" category (table 11).

Inventory performance for the 1956 fiscal year compared with that of 5 years earlier was as follows:

Item	1956	1952
Cost of farm supplies sold	\$1,288,571	\$1,115,142
Year-end inventory	\$96,747	\$92,774
Inventory turnover (times) <sup>1</sup>	13	12
Proportion of assets in inventory (percent)	15	16

<sup>1</sup>Based on cost of goods sold.

Branch managers and department heads were responsible for purchasing regular items, although the county manager ordered all feed ingredients and all carload lots of any item.

Inventories were taken quarterly with records adjusted once a year.

A once-a-year, open-house promotion of slow-moving items had proved satisfactory. Improved employee morale had been gained by frequent meetings, picnics, and joint action in outlining and achieving operational goals.

### Cooperative 8

Cooperative 8 had total farm supply sales of over \$1.6 million in 1955 with

Table 12. - Farm supply sales and inventory data for Cooperative 8, fiscal year 1955

Commodity	Farm supply sales		Quarterly average inventory		
	Amount	Proportion of total	Amount	Proportion of total inventory	Inventory turnover <sup>1</sup>
		Percent		Percent	Times
Feed	\$597,371	36	\$26,891	30	22
Petroleum	511,485	31	8,184	9	62
Fertilizer	232,468	14	7,817	9	30
Seed	115,241	7	12,118	13	10
Subtotal	1,438,565	88	55,010	61	26
Other	190,700	12	34,636	39	6
Total or average	1,629,265	100	89,646	100	18

<sup>1</sup>Based on sales and quarterly inventories.

88 percent in four commodity groups. Feed and petroleum accounted for 36 and 31 percent, respectively. Total inventory was turned 18 times based on total sales (table 12).

Inventory performance for the 1955 fiscal year compared with that of 5 years earlier was as follows:

Item	1955	1951
Cost of farm supplies sold	\$1,381,543	\$1,207,533
Year-end inventory	\$87,794	\$98,650
Inventory turnover (times) <sup>1</sup>	16	12
Proportion assets in inventory (percent)	18	22

<sup>1</sup>Based on cost of goods sold.

Department heads in the county headquarters office and branch managers did the purchasing for their respective

operations. Purchases of all feed ingredients and new items needed the approval of the general manager.

By using its own trucks for making weekly trips to the regional wholesale warehouse, this local considerably reduced its inventory on hand. An operational traffic man consolidated branch purchases.

This association employed four local fieldmen who took orders for merchandise and otherwise served farmer patrons. The advertising budget was reduced to support the fieldman program, and this was believed to be a more wise use of funds.

It took a physical inventory every 3 months and adjusted records yearly. Arranging stock beforehand and using personnel most familiar with each type of commodity made inventory taking easier.